St. Petersburg State University
Graduate School of Management
Master in Corporate Finance Program

THE IMPACT OF CORPORATE MERGERS AND ACQUISITIONS ON COMPANY PERFORMANCE IN BRICS COUNTRIES

Master's Thesis by the 2nd year student
Concentration – Master in Corporate Finance
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ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

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АННОТАЦИЯ

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Название ВКР	Влияние корпоративных слияний и поглощений на результативность компаний стран БРИКС
Образовательная программа	Корпоративные финансы
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Научный руководитель	Никулин Егор Дмитриевич, доцент, к.э.н.
Описание цели, задач и основных результатов	Цель данной работы - ответить на вопрос, влияют ли слияния и поглощения на результаты деятельности компаний в странах БРИКС, на основе выборки из 100 сделок за период 2006–2017. Для ответа на этот вопрос нами был выбран поход, основанный на финансовой отёчности. EBITDA выбрана в качестве показателя операционной деятельности. EBITDA делится на балансовую стоимости активов (ROA) и продажи (ROS). Кроме того, мы корректируем показатели операционной деятельности в соответствии с отраслевыми тенденциями, а также с учетом отрасли, размера и операционной эффективности до сделки. В качестве модели для оценки мы используем Intercept model и Change model. Результаты показали повышение эффективности объединенных фирм после слияний и поглощений. Intercept model и Change model показали аналогичные значимые результаты. Наш анализ факторов, определяющих операционные результаты после сделки, показывает, что относительный размер приобретаемой компании для ROS положительный и значимый. Трансграничные сделки для ROA положительны и значимы. Государственная собственность для ROA отрицательна и значима. Ни одна из других факторов, таких как средства платежа и отраслевая принадлежность, не оказались значимыми.
Ключевые слова	Слияния, Поглощения, Операционные результаты, Анализ финансовой отчетности, Влияние сделок на финансовые результаты, БРИКС

ABSTRACT

Master Student's Name	Sheremetev Sergei Sergeevich
Master Thesis Title	The Impact of Corporate Mergers and Acquisitions on Company Performance in BRICS Countries
Educational Program	Master in Corporate Finance
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Academic Advisor's Name	Egor D. Nikulin, Associate Professor
Description of the goal, tasks and main results	The goal of this master thesis is to answer the question whether corporate mergers and acquisitions have impact on company performance in BRICS countries based on the sample of 100 deals that took place in 2006-2017. In order to answer this question, accounting-based studies are used. The EBITDA is chosen as indicator of operating performance. EBITDA is deflated by the book value of assets (ROA) and sales (ROS). Also, we adjust performance measure to industry trends and for industry, size and pre-performance. As a model for the assessment, we use Intercept model and Change model. We find an enhancement of post-M&A performance of the combined firms. Both change and intercept model suggest similar significant results. Our analysis of the determinants of the post-acquisition operating performance reveals that relative size of target for ROS is positive and significant. Value for cross-border deals for ROA is positive and significant. Value for State ownership for ROA is negative and significant. None of the other takeover characteristics such as means of payment and industry-relatedness have significant explanatory power.
Keywords	Mergers, Acquisitions, Operating performance, Analysis of financial statements, M&A's impact on financial performance, BRICS

INTRODUCTION

Starting from the 21st century we can observe a shift from developed markets of North America and Western Europe to Emerging markets. A more and more important role in the global economy is playing BRICS. BRICS is the acronym of five major emerging economies: Brazil, Russia, India, China, and South Africa. The BRICS have a combined area of 39 mln km squared and an estimated total population of about 3.21 billion, or about 27% of the world land surface and 42% of the world population (BRICS. Wikipedia. Wikimedia Foundation, 2001). The same situation is with GDP, BRICS produce 24% of nominal GDP and 32% of the World's GDP PPP (O'Neill, 2021). Now it's clear how important BRICS to the World Economy and what is more important the role of BRICS is growing every year. As developed countries struggle to grow in terms of GDP, BRICS countries grow at rates higher than World Economy.

The growth of the country goes the same direction as the growth of companies in the same country. One of the most popular ways for a company to grow is mergers and acquisitions. M&A have many potential benefits, which mainly focus on boosting profits and shareholder value through:

- the economies of scale produced by increasing market share;
- the expanded use of an existing distribution network by the acquisition of new product capabilities;
- the extension of a strong product capability into new markets;
- the diversification of product and market risks.

This way mergers and acquisitions become an essential tool for corporate development in today's global marketplace, which is characterized by consolidation, convergence, the competition for talent and technology, and the increasing importance of such intangible assets as knowledge, skills, and customer relationships (Tamosiuniene and Duksaitė, 2009)

M&A is indeed a global process that involves companies from all over the world as management of these companies is seeking to take advantage of potential benefits and synergies stated above. BRICS countries playing key role in this market as share of M&A deals of BRICS companies in global volume raised from 3,7% in 1996 to 26% in 2018 and 25% in 2020.

The research topic mergers and acquisitions is widely studied from different sides but still, there are some gaps especially if we talking about the BRICS market. Academic papers mainly concentrate on the effects of M&A strategies in developed countries, while such effects in countries with emerging capital market are much less explored. Most of the studies of emerging markets are focused only on India and China and to the best of my knowledge, there are no studies

that analyze the post-M&A performance of the companies in BRICS using accounting studies approach based on financial results of acquirers before and after acquisitions.

Hence, Papadakis and Thanos (2010) suggested a need for more geographically diverse samples to overcome the UK and US bias in the field of M&A studies. Thanos and Papadakis (2012a) suggest a need to look at emerging economies, because M&A results in the developed world may be valid for the developed world, but may not be valid for the developing world (Wong and Cheung, 2009)

For some time, many researchers have addressed the influence of corporate acquisitions on performance improvements. Unfortunately, there appears to still be no consensus as to whether acquisitions create improvements in company performance or not.

Moreover, additional cost burdens arising in emerging markets from the necessity of gaining permits and government approval might make the acquisitions less likely to eventually improve the acquirer's profitability. Given the importance of the state in BRICS, it is necessary to take this factor into account. State ownership can lead to lower performance due to lower internal efficiency incentives, stronger organizational rigidities, or non-profit maximizing behavior (Megginson and Netter, 2001).

There are also other important characteristics (Radygin., 2010) of the M&A process in emerging markets:

- the weakness of government regulatory agencies' oversight of the M&A processes;
- the low involvement of organized securities-market tools in the process of mergers and acquisitions (most of the transactions are not with the assets of public companies, but with private companies);
- the inability of minority shareholders to significantly influence the company's actions;
- in most cases, the company's owner is also its top manager;
- the lack of a transparent ownership structure of formally public companies (the ultimate beneficiaries);
- the concentration of a significantly larger block of shares in the hands of a single owner, on average, than is typical of Western public companies.

The object of the research is the sample 100 M&A deals of BRICS public companies that occurred in years 2006-2017.

The subject of the master thesis is post-M&A performance in BRICS countries

The research goal of this master thesis is to define the impact of corporate mergers and acquisitions on company performance in BRICS countries and to investigate factors that influence post-M&A performance. To achieve the research goal the following objectives are defined:

1. Study theoretical aspects of mergers and acquisitions. Including classifications and motives for M&A transactions;
2. Analyze dynamics and current state of M&A in BRICS;
3. Based on literature review analyze approaches to measuring post-M&A performance and factors influence it;
4. Justify research methodology and collect the necessary data;
5. Conduct empirical research to make conclusions on impact of M&A transactions on company performance and factors that influence it;
6. Analyze the results of empirical research and make theoretical and practical conclusions.

The structure of this master thesis is divided into two parts: theoretical and practical.

In the first chapter, we introduce theoretical aspects of mergers and acquisitions, the classification of deals, and main motives. Also, we list and analyze what different approaches scholars suggest on how to estimate post-M&A performance and factors that influence it. Then we define the approach that has been chosen by us and introduce hypotheses.

In the second chapter, we transfer theoretical considerations to the empirical field. We define the research methodology. Describe sample and its selection process. Afterward, we run the regression analyses, test hypotheses and deliver the main findings. In the end, we make conclusions and justify the managerial application of obtained results.

CHAPTER 1. THEORETICAL ASPECTS OF MERGERS AND ACQUISITIONS

1.1. Concept of mergers and acquisitions

In the strictest sense, **a merger** is a combination of two or more entities where each merging entity has an equal stake in the new enterprise and each merging entity has a very clearly defined role in the new entity. This ideal is the vaunted merger of equals. Daimler's 1998 combination with Chrysler was a merger of equals. In a more practical sense, so-called mergers of equals are rare; one side usually ends up controlling the enterprise. For example, the years following the Daimler-Chrysler merger showed that Daimler executives planned all along to control the combined entity (Snow, 2018).

Mergers are far less common than acquisitions. **An acquisition** is when one company buys another company, a division of another company, or a product line or certain assets from another company. Actually, an acquisition is when any kind of business purchases another part (or all) of another business. Although some companies grow organically (from within by creating and selling products or services), an acquisition allows a company to bypass the growth stage by simply buying existing sales and profits. Starting up a new product line may be less expensive than buying an existing one, but the market may take a while to adapt to the new product, if it does at all. For this reason, buying other companies rather than relying on organic growth may make sense for a particular company (Snow, 2018).

A Buyer may acquire all or part of a company, the stock of the company, or certain or all assets and even assume some of the liabilities. Despite this wide variety of possibilities, Buyers typically fall into four broad types:

- **Strategic Buyers**: These Buyers are other companies planning to combine operations of the two companies to some extent (as opposed to buying strictly for financial reasons). For example, when Oracle buys a company, Oracle is considered a strategic Buyer because it buys companies that have some sort of synergy to its business.
- **Financial Buyers**: Financial Buyers are funds of money that buy companies. Financial Buyers of middle market and lower middle market companies are typically private equity (PE) funds, which are essentially large pools of money
- **Other companies backed by PE funds**: The company will be the new owner of the acquired company, but another entity (the fund) is providing the dough to do the deal.
- **Individuals**: Although it happens, an individual buying a middle market or lower middle market company is rare. When individuals buy companies, those companies tend to be small retail shops, consulting firms, or construction companies. Typically, these companies have revenues of less than $1 million (Snow, 2018).

Here's a quick look at the types of Sellers you may find in the world of M&A:

- **The spinoff**: A company may be divesting a division, a product line, or certain assets.
- **The change of control**: This company is selling enough of itself (more than 50 percent) to result in a change of control. In these cases, the owner or owners most likely receive the money. Colloquially, this approach is called taking some chips off the table.
- **The recap**: Sometimes an owner wants to take some chips off the table without giving up control of the company. This situation is called a recapitalization, or recap for short.
- **The growth capital**: A Seller may issue more stock for the purposes of raising capital to invest in the business. In this case, the owner isn't actually selling the company but rather selling more stakes in the company. The money from the sale doesn't flow to the owner; instead, the company retains the money to fund growth (Snow, 2018).

Depending on the type of mergers and acquisitions, there are:

- **Horizontal M&A**. Companies from the same industry producing similar products/services and competing with each other. Horizontal mergers typically tend to increase market share, use economies of scale, and exploit merger synergies. For example, the merger between Exxon and Mobil will allow both companies a larger share of the oil and gas market.
- **Vertical M&A**. Companies from the same industry but operating at different levels within the same supply chain. Such vertical integration tends to increase synergies through the cost reduction, higher quality control and reducing time to market for products. For example, Merck, a large manufacturer of pharmaceuticals, merged with Medco, a large distributor of pharmaceuticals, in order to gain advantage in distributing its products.
- **Conglomerate M&A**. Companies from the unrelated industries. Conglomerate merger tends to increase market share, diversify businesses, cross-sell their products, and to take advantage of synergies. For example, General Electric(GE) has diversified its business through mergers and acquisitions, allowing GE to get into new areas like financial services and television broadcasting.
- **Market-Extension M&A**. Companies from the same industry producing similar products/services but operate in different markets. Market extension give access to a larger market and therefore a larger customer base and new sales channels. For example, RBC Centura's merger with Eagle Bancshares Inc. in 2002 was a market-extension merger that helped RBC with its growing operations in the North American market. Eagle Bancshares owned Tucker Federal Bank, one of the biggest banks in Atlanta, with over 250 workers and $1.1 billion in assets (Corporate Finance Institute, 2020).
- **Product Extension or congeneric merger M&A**. Companies that produce related products /

services and that operate in the same market or sector. Products of both companies combined together and the lead to synergies and access to a larger market and therefore a larger customer base and new sales channels. For example, the merger between Mobilink Telecom Inc. and Broadcom is a product-extension merger. The two companies both operate in the electronics industry and the resulting merger allowed the companies to combine technologies. The merger enabled the combination of Mobilink's 2G and 2.5G technologies with Broadcom's 802.11, Bluetooth, and DSP products. Therefore, the two companies are able to sell products that complement each other (Evans, 2011; Corporate Finance Institute, 2020).

Depending on the nationality of the companies participating in M&A, two types of mergers can be distinguished:

- **National (domestic)** of companies located within the same state;
- **Transnational (cross-border)** - the merger of companies located in different countries, the M&A of firms in other states; these M&A are difficult to carry out because the merging counterparties operate in different legal systems and can carry out their activities in strategically important sectors for the state.

Depending on the attitude of the management of companies to a merger or acquisition transaction, the following types of mergers can be distinguished:

- **Friendly** M&A assume that both the buyer and seller voluntarily enter into a deal. Most of these associations are of this nature. They are based on the mutual agreement of the interests of the parties who believe that it is better for them to cooperate than to oppose each other, and that they can jointly work out a constructive solution.
- **Hostile** M&A, in which the management or shareholders of the target company do not agree with the impending or completed transaction and take a number of counter-takeover measures. In this case, the acquiring company has to conduct actions on the securities market against the target firm with the aim of acquiring it, or to challenge the actions already taken in court. An example of a successful hostile takeover is that of pharmaceutical company Sanofi-Aventis's (SNY) acquisition of Genzyme Corp. Genzyme produced drugs for the treatment of rare genetic disorders and Sanofi-Aventis saw the company as a means to expand into a niche industry and broaden its product offering (Ganti, 2019).

The major channels through which M&A can increase the performance of acquirers are the achievement of synergies and the correction of mistakes made by management (Martynova and Renneboog, 2006). Synergies can be operational or financial. Operational synergies are more common in M&A between related industries (Comment and Jarrell, 1995), and can arise from economies of scale, economies of scope, decrease in agency cost, and knowledge or skill transfer (Ravenscraft and Scherer, 1989). On the other hand, financial synergies usually arise from

diversifying deals (Martynova and Renneboog, 2006) through a decreased probability of bankruptcy, more stable cash flows, and easier access to capital (Higgins and Schall, 1975; Stein, 1997).

Economies of scale often refer to the reduction in average total costs for a firm producing a single product for a given scale of plant due to the decline in average fixed costs as production volume increases. Scale is defined by such fixed costs as depreciation of equipment and amortization of capitalized software, normal maintenance spending, and obligations such as interest expense, lease payments, long-term union, customer, and vendor contracts, and taxes. Economies of scale also affect variable costs such as a reduction in purchased material prices due to an increase in bulk purchases and lower production line setup costs resulting from longer production runs. When one company buys another, the combined firms may be able to negotiate lower purchase prices from suppliers because of their increased leverage.

Economies of scope refers to the reduction in average total costs for a firm producing two or more products, because it is cheaper to produce these products in a single firm than in separate firms. Economies of scope may reflect both declining average fixed and variable costs. Common examples of overhead- and sales-related economies of scope include having a single department (e.g., accounting and human resources) support multiple product lines and a sales force selling multiple related products rather than a single product.

Financial synergy refers to the reduction in the acquirer's cost of capital due to a merger or acquisition. This could occur if the merged firms have cash flows that are relatively uncorrelated, realize cost savings from lower securities' issuance and transactions costs, or experience a better matching of investment opportunities with internally generated funds. Target firms, unable to finance their investment opportunities, are said to be financially constrained, and they may view access to additional financing provided by an acquirer's unused borrowing capacity or excess cash balance as a form of financial synergy (DePamphilis, 2019).

1.2. BRICS countries M&A overview

BRICS is the acronym of five major emerging economies: Brazil, Russia, India, China, and South Africa. Brazil is largest economy in Latin America, Russia largest emerging economy in Europe. India and China largest economies in Asia and South Africa one of the largest economies in Africa, so we can see BRICS is major emerging economies from all other the world. BRICS influence is seen in many areas: Russia one of the largest exporter of wheat and mineral resources in the world. China has the globe's largest industrial and manufacturing capacity. India is to the fore of the scientific, technological and pharmaceutical fields. Brazil is endowed with

abundant mineral, water, biological and ecological resources, and South Africa abounds in natural resources. (Kulkarni, 2018)

There are several reasons for the high activity of companies from the BRICS countries in mergers and acquisitions. First, there are high rates of return inherent in emerging markets. Second, it is high, relatively developed markets, rates of economic growth, which promotes mergers and acquisitions, which have three key investment motives: access to energy and natural resources; access to fast-growing consumer goods markets; and the desire of BRICS companies to gain access to management and production technologies in developed markets. According to Khanna and Palepu (2009), the diffusion of skills, processes and technologies in the global market brings together developed markets and fast-growing economies, but as long as this gap exists, it offers additional incentives for companies to develop.

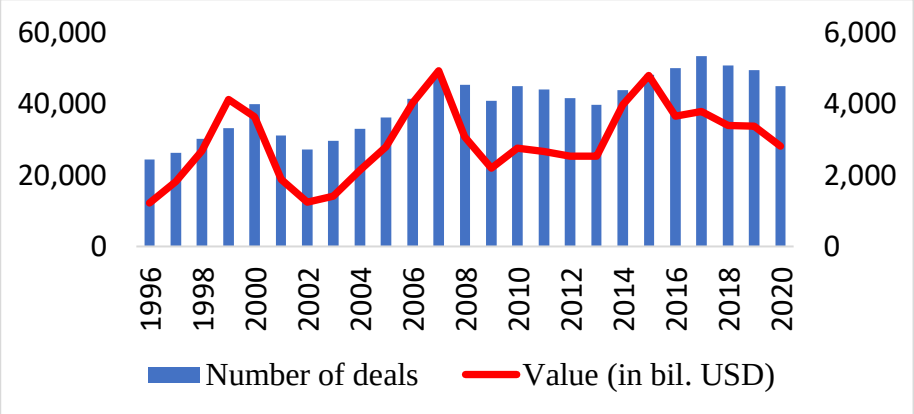
In Figure 1 we can see the number of M&A deals and the volume of transactions for each year starting from 1996. Global volume and number of deals are cyclical. M&A commonly occur during periods of sustained high rates of economic growth, low or falling interest rates, and a rising stock market. Historically, each merger wave has differed in terms of a specific development (such as the emergence of a new technology), industry focus (such as rail, oil, or financial services), degree of regulation, and type of transaction (such as horizontal, vertical, conglomerate, strategic, or financial deals) (DePamphilis, 2019). We can see in Table 1 three picks 1999-2000, 2007-2008 and 2015. As a number of deals grow in time, in terms of value pick years are more or less the same for the last 20 years.

The situation in BRICS countries is different. As we can see in Figure 2 number and value of deals have grown rapidly until it picks in 2015. From 1996 to 2015 Compound annual growth rate (CAGR) is 19%. What is a more important share of M&A deals of BRICS in Global volume raised from 3,7% in 1996 to 26% in 2018 and 25% in 2020.

At the same time number of deals and volume in BRICS decreased from 2015 to 2020 mostly because M&A activity in China has fallen and China has largest share in terms of volume and numbers of deals in BRICS. There are several reasons for that, one of them US and China governments trade tensions. Also, mergers and acquisitions activity were hurt by new restrictions on investments in the US and other markets. Moreover, Chinese regulator authority started more closely monitoring outbound investments. M&A activity has fallen not only in China, it has also fallen in Russia. The reason for that international sanctions against Russia initiated by US, EU and other countries. Started from 2014 it is prohibited for some Russian companies to invest in other countries economies and vice versa, so sanction also affected Russian M&A activity.

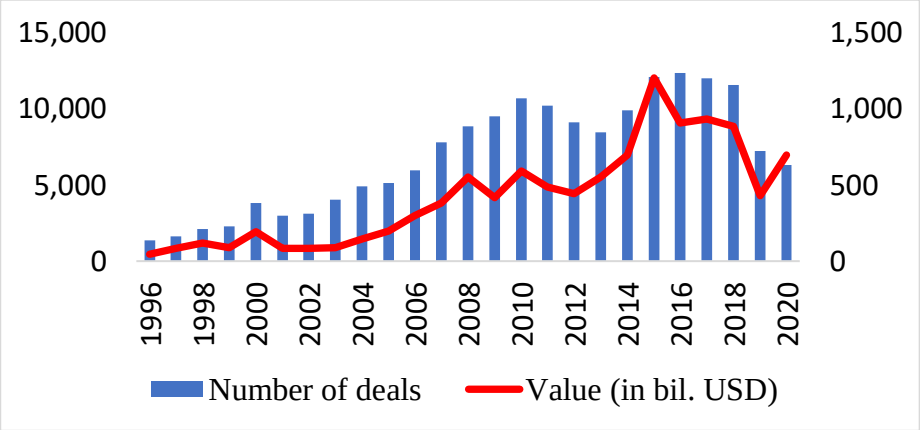
Overall statistic shows that role of BRICS countries in the world M&A market is huge and it will grow in the future despite current fall in M&A activity that's why it is important to study post-merger / acquisition performance in these countries.

Figure 1 Global M&A deals 1996-2020



Source: Institute for Mergers, Acquisitions and Alliances (IMAA)

Figure 2 BRICS M&A deals 1996-2020



Source: Institute for Mergers, Acquisitions and Alliances (IMAA)

1.3. Impact of M&A on company performance

Researchers commonly employ two approaches to assess the impact of M&A on company performance: event studies and accounting studies. The first one is based on analyzing the stock market's reaction to M&A announcements, while the second one examines the reported financial results of acquirers before and after acquisitions to understand how operating performance has changed due to the deal (Grigorieva and Petrunina, 2013).

Stock market evidence strongly indicates that target shareholders gain significantly in M&A deals. Cumulative abnormal returns (CAR) vary significantly, regardless of variations in the sample size, event window, and time period (Schwert, 1996; Goergen, Renneboog, 2004; Kiymaz,

Baker, 2008). Returns to acquiring firms are sometimes positive, sometimes negative, and sometimes equal to zero (Moeller et al, 2005, 2007; Chang, Tsai, 2013).

Likewise, the environment in emerging markets is normally characterized by weaker disclosure requirements, the persistence of earnings management (Leuz et al., 2003), and there is poor information intermediation. Thus, investors are not able to distinguish the equity stocks of well-performing firms from the bad ones (Morck et al., 2000). Consequently, the use of event studies in these markets is even more controversial, since they lack efficiency and are likely to have fully incorporated the price changes before the announcement date (Narayan and Thenmozhi, 2014).

Thus, a need for a different perspective emerges that of company fundamentals. This group of studies usually assesses changes in company performance in terms of key indicators. The use of financial accounting data has several advantages (Thanos and Papadakis 2012b). For example, accounts information is objective because they report actual performance and is available to the public, including for unlisted companies. (Thanos and Papadakis, 2012b). Healy et al., (1992) posit that returns around the takeover announcement represent investor's expectation of acquisition benefits whereas post-acquisition cash flow operating performance measures the actual benefits, if any, generated by acquisitions. If synergies truly exist, economic gains from mergers should thus show up in the combined firm's fundamentals.

Studies where authors used performance measures based on cash flow (such as operating cash flow to the total market value of a firm, or the book value of a firm, or sales) usually suggest improved company performance following acquisitions (Healy et al, 1992; Switzer, 1996; Powell, Stark, 2005), while studies that use profitability-based measures (return on assets or return on equity) indicate that mergers perform as well as relevant benchmarks, or merged companies experience a significant decline in margins (Yeh, Hoshino, 2001; Sharma, Ho, 2002; Tsung-Ming, Hoshino, 2000). This suggests that accounting rules may distort performance measurement and lead to a negative assessment of mergers. The differences in results are also due to differences in national environments, accounting standards, sample size, sample period, and statistical methodology. Academic papers mainly concentrate on the effects of M&A strategies in developed countries, while these effects in emerging capital markets are virtually unexplored. For more information about the most important studies regarding post-M&A operating performance see literature review in Appendix 1.

The most cited study about post-acquisition performance by Healy et al. (1992). Healy et al examine post-acquisition performance for the 50 largest U.S. mergers between 1979 and mid-1984. Merged firms show significant improvements in asset productivity relative to their industries, leading to higher operating cash flow returns. This performance improvement is

particularly strong for firms with highly overlapping businesses. Mergers do not lead to cuts in long-term capital R&D investments. They use pretax operating cash flow returns on assets to measure improvements in operating performance. Conceptually, they focus on cash flows because they represent the actual economic benefits generated by the assets. Since the level of economic benefits is affected by the assets employed, they scale the cash flows by the assets employed to form a return measure that can be compared across time and firms. They measure assets employed using market values, which represent the opportunity cost of the assets. Also, Healy et al introduced the usage of industry median as a benchmark, to control for economywide and industry factors. Hence, they use the abnormal industry-adjusted performance of the target and bidding firms as primary benchmark to evaluate post-merger performance.

Another important study is Martynova et al. (2007). They investigate the long-term profitability of corporate takeovers of which both the acquiring and target companies are from Continental Europe or the UK. Their analysis is based on a sample of 155 European mergers and acquisitions, completed between 1997 and 2001. They employ four different measures of operating performance: EBITDA and EBITDA corrected for changes in working capital, each scaled by the book value of assets and by sales. Both acquiring and target companies significantly outperform the median peers in their industry before the takeovers, but the raw profitability of the combined firm decreases significantly following the takeover. However, this decrease becomes insignificant after they control for the performance of the peer companies which are chosen to control for industry, size, and pre-event performance. None of the takeover characteristics (such as means of payment, geographical scope, and industry-relatedness) explain the post-acquisition operating performance.

Martynova et al. (2007) used a sample of companies from developed countries and Grigorieva and Petrunina (2013) used the same research methodology for emerging markets. Examining a sample of 80 deals initiated by companies from emerging capital markets over 2002-2009, they find that M&As are value-destroying deals for the combined firms. Results from the long-run analysis prove the negative industry-adjusted differences between post-acquisition and pre-acquisition performance measures. Operating performance analysis demonstrates that the median industry-adjusted EBITDA/Sales ratio declined by -3.3% after deals. These results are consistent with the outcomes of Mantravadi and Reddy (2008), who found a negative impact of M&A on company performance in some Indian industries. And are inconsistent with Martynova et al (2007), Powel and Stark (2005), and Switzer (1996), who examined the effects of M&A on company performance in developed European and US markets respectively. Another example of an emerging market is Rao-Nicholson et al. (2016) examined the post-M&A operating performance of 57 deals of ASEAN companies over 2001–2012. They followed the same test

techniques as Healy et al. (1992) and Ghosh (2001). Using various measures of adjusted operating performance (OP), they find, on average, a deterioration of post-M&A performance of the combined firms as measured by the return on assets. The industry-adjusted operating performance tends to decline in the 3 years following an M&A. Bertrand and Betschinger (2012) investigate the long-term impact of domestic and international acquisitions, initiated by Russian firms, on their operating performance based on a sample of more than 600 acquirers. They find rather negative effects associated with acquisitions. At best, acquisitions do not destroy value.

Considering that results for the emerging market are mostly negative we theorize:

H1: There is significant negative change in the operating performance of the acquirer companies following M&A deals

1.4. Factors affecting post-M&A performance

Method of payment: cash versus stock

The choice of method of payment in mergers and acquisitions (M&As) has important implications for both the acquirer and target, including post-takeover ownership structure, risk profile, and the allocation of gains from the transaction (Martin, 1996; Faccio and Masulis, 2005).

Despite simplicity of cash transactions this type has some potential drawbacks. The main disadvantage of cash transactions is that buyers in this situation take on all the potential risk associated with the merger. When shares are transferred, this risk is at least allocated amongst the shareholders in relation to their proportion of shares.

Beginning with Myers and Majluf (1984) it has been argued that asymmetric information between the bidder and the target on the value of the bidder shares allows the bidder to offer shares if these are overvalued and to offer cash if they are undervalued. This impact of asymmetric information has been confirmed as being relevant for the choice of the payment. (Ismail and Krause, 2010).

Another frequently cited aspect for choosing the payment form is the influence of taxation. In cash offers the target shareholders often are liable to taxation on the profits they have made and thus would require a higher premium. The bidder will thus accumulate a higher goodwill whose depreciation will reduce future profits and thus tax burdens. Depending on the importance to show high profits for the bidder and the amount of additional tax to be paid by target shareholders, cash or shares will be offered (Ismail and Krause, 2010).

The third major factor commonly mentioned to determine the payment form is the aspect of managerial control. By using shares as payment, existing shareholders are diluting their stake in the bidding company and hence losing control over the company (Ismail and Krause, 2010).

A bidder who has large growth opportunities will more commonly seek to pay acquisitions by means of shares as that way they can preserve their cash reserves to finance investments required for their growth (Martin, 1996)

The relative size of the two companies will be relevant as the larger amount of cash required for a large target company might be difficult to obtain (Moeller, Schlingenmann, and Stulz 2004)

The estimates shows that cash-financing deals originated a higher profitability improvement than transactions financed with equity or a mixture of securities (Linn and Switzer, 2001; Ghosh, 2001; Moeller et al., 2004; Rao-Nicholson et al., 2016)

H2: Cash-financed M&A is likely to have a positive effect on post-M&A performance as compared to stock or mix financing.

Industry relatedness

In the case of horizontal M&As, it is expected that combined companies will generate new products and new technologies in which both scale and scope effects seem to be beneficial to the performance of the merged companies. For vertical M&As, cost reduction by means of integrating upstream or downstream partners can be expected to generate economic results. For unrelated M&As these effects of scope and scale economies are in general more difficult to materialise and these M&As are mainly intended to achieve financial synergies (Hagedoorn and Duysters, 2000).

At the same time, when a company is involved in a diversifying deal, it faces a higher level of informational asymmetry, since it does not understand the business as much as in a focusing deal (Grigorieva and Petrunina, 2013).

Evidence regarding effect on post-merger/acquisition performance is mixed. Powell and Stark (2005), Linn and Switzer (2001), Switzer, (1996), Sharma and Ho (2002), and Martynova et al. (2007) found that industry commonality has no impact on post-acquisition performance. Other authors defend that diversifying acquisitions significantly outperform their industry-related peers (Ghosh, 2001), and some empirical evidence defend a negative effect in performance as a result of diversifying acquisitions (Healy et al., 1992; Heron and Lie, 2002).

Considering mix results and that most of the studies report no significant result we theorize:

H3: Relatedness of industries is likely to have no effect on post-M&A operating performance

Domestic versus cross-border deals

There are different theories of how cross-border M&A creating market value in emerging economies. First, based on the theory of ownership advantages, the effects on firm market value

may come from ownership advantages, location advantages, and internalization advantages (Meyer et al., 2014; Omay and Iren, 2019). Second, based on the theory of institutional arbitrage, firms may invest overseas to avoid a weak domestic institutional environment or a weak institutional environment in their home country (Buckley, 2018). This works especially when firms invest in advanced markets where property rights are better protected. Third, from the perspective of learning effects, the integration of targets expands the knowledge of the acquirer and enhances the firm's subsequent survivability (Vermeulen and Barkema, 2001). For firms in emerging countries, firms interconnect during the process of internal learning to overcome resource deficiencies (Mathews, 2017). Fourth, based on springboard theory, multinational firms in emerging countries can achieve multiple strategic objectives by using international expansion as a springboard, such as through acquiring strategic assets, compensating for disadvantages in the domestic market, using specific location advantages, and responding to disadvantages in the home country (Luo and Tung, 2018; Ding et al., 2021).

The expected synergistic value may not be accomplished due to regulatory and cultural differences between the bidder and target countries which may lead to complications in managing the post-merger process and even deteriorate the performance of acquiring firms. Also, information asymmetry may cause acquirers to pay higher premiums and choose adverse payment methods (Moeller and Schlingemann, 2004; Gomes et al., 2013, Martynova and Renneboog, 2006, Goergen and Renneboog, 2004).

H4: Cross-border deals is likely to have a negative effect on post-M&A performance as compared to domestic deals

The relative size of the target

Takeovers of relatively large targets are more likely to achieve sizeable operating and financial synergies and economies of scale than small acquisitions, therefore leading to stronger post-acquisition operating performance (Martynova et al., 2007). Moreover, M&As that involve relatively large targets enable bidders to quickly take advantage of valuable assets such as strong market position, well-recognized branch, and established distribution network (Alexandridis et al., 2012).

However, the acquirer of a relatively large target may face difficulties in integrating the target firm, which could lead to a deterioration of performance. (Martynova et al., 2007). The larger the target company is the more complex is its organizational structure. After the takeover new management of the target company can find themselves in the situation of losing control over the organization or they are going to need a longer period of time for adjustment because of the complex organizational structure of acquired company (Ravenscraft and Scherer, 1989). A small

target might be expected to contribute only a small amount to the overall performance of the combined entity and hence any overall performance change might be related to the size of the target as compared with the size of the bidder (Linn and Switzer, 2001).

Most of the empirical evidence reports no significant relation between the relative target size and post-merger performance (Healy et al., 1992; Heron and Lie, 2002; Sharma and Ho, 2002; Moeller et al., 2004; Powell and Stark, 2005; Rao-Nicholson et al., 2016).

Considering that most of the studies report no significant result we theorize:

H5: The relative size of the target is likely to have no effect on post-M&A operating performance

State ownership

Institutions defined as "the rules of the game" and have a significant impact on emerging market firms' behavior because government and societal influences are stronger in emerging market economies compared to developed countries (Hoskisson, Eden, Lau, & Wright, 2000). Institutions help shape firm structures and influence firms' strategic choices and competitiveness (Fligstein, 1996). Good institutions facilitate effective functioning of market mechanisms, enabling firms and individuals "to engage in market transaction(s) without incurring undue costs or risks" (Meyer et al, 2009), and increase firm value (Shleifer & Vishny, 1994). However, "bad" institutions increase the cost of doing business (Ang & Michailova, 2008). Also, state ownership unavoidably brings political objectives into corporate decision making, which can damage corporate value (Shleifer & Vishny, 1994). Conversely, it is argued that state ownership of firms in emerging markets can lead to preferential treatment from the government and favourable allocation of resources, thereby enhancing the value of a firm (Sun and Tong, 2003, Du and Boateng, 2015). According to Bertrand and Betschinger (2012), the negative impact of state ownership can be due to incentives problems or the fact that state-owned firms per se follow other objectives than profit maximization.

H6: State ownership is likely to have negative effect on post-M&A operating performance

Summary of Chapter 1

One of the most popular ways for a company to grow is mergers and acquisitions. In first chapter we introduced theoretical aspects of this process. As we described there are different types of mergers and acquisitions. Companies could be from different countries, industries or from the same, the attitude could be different: hostile or friendly but one thing is constant that is motives. Companies is always looking for some sort improvements. That sort of improvements is different in each transaction but all acquirers want to achieve it. They could achieve it through new

technologies, new markets, new resources, synergies either operational or financial but do mergers and acquisitions really create value for companies.

Mergers and acquisitions are not the new thing for the world. We could find deals that were 100 years ago and even more but if we take a look at emerging markets we will see that a rapid growth of M&A deals started only 20-30 years ago. As we stated in first chapter huge part 25% of all M&A deals nowadays is BRICS companies but post-M&A performance in such countries are still much less explored than for developed countries, so we can see here a clear research gap to determine post-M&A performance in BRICS.

As we stated in first chapter based on literature review the best way is to determine post-acquisition performance is usage of accounting-based approach. Approach based on stock market reaction will work only in case of no information asymmetry, fully rationality of participants and sufficient liquidity but that is not the case for emerging markets. Also, returns around the takeover announcement represent investor's expectation of acquisition benefits whereas post-acquisition cash flow operating performance measures the actual benefits, if any, generated by acquisitions. If synergies truly exist, economic gains from mergers should thus show up in the combined firm's fundamentals (Healy et al, 1992).

We decided to use operating cash flow as performance measure that will show effect on operating performance of the company due to the fact of M&A transaction. Based on comprehensive literature review we formulated main hypothesis the M&A deals lead to negative impact on company performance and also we defined factors that could influence that performance, such as: if deal is domestic or cross-border, cash or equity financed, in related or unrelated industries, relative size of the target and state ownership. For each factor we also formulated hypothesis that will be tested on the basis of practical research in the next chapter

CHAPTER 2. EMPIRICAL RESEARCH

2.1. Sample selection

The present study focuses only on BRICS domestic and cross-border M&A activity over the period 2006–2018. The data set is obtained from Refinitiv Eikon database. Our sample meets the following criteria:

1) acquiring and target firms are public companies. This is due to the reason that not all companies even large in BRICS countries make financial statements available for the public but public companies have to make them. Also, public companies usually are more regulated and that's why financial data are more reliable for analysis;
2) the financial sector are excluded due to different financial reporting standard;
3) deals in which the acquirer is the management or the employees were left out;
4) we also eliminate transactions from serial acquirers, who are involved in more than one M&A deal over the period 3 years before and after the transaction;
5) deal must be announced and completed;
6) the percentage of shares held prior transaction less than 50% and the percentage of final stake minimum 50,01%;
7) we focus only on transactions classified as mergers or acquisitions, excluding all the cases defined as an acquisition of assets, buyback, reorganization, recapitalization or reverse merger;
8) only transactions greater than 10 million dollars are included;
9) and lastly, the acquirer and target need to have financial and accounting data available for three years before and three years after the deal.

In our sample, we focus on the year of the M&A transaction's completion, rather than the year of the announcement as in some cases in the year of announcement no integration was made and it could take several years from announcement to integration.

Also, following Healy et al (1992) the year of the merger is excluded in the analysis because of the differences between the purchase and pooling methods in timing the consolidation of the target with the acquirer. Excluding the first year also mitigates the effect of inventory write-ups under the purchase method, since this inventory is usually included in the cost of sales in the merger year.

2.2. Sample description

Our sample consists of 100 acquisitions with a total market value of 184 769 million dollars. For full list of deals with dates and values see Appendix 2. The main difficulties with

sample selection are that companies usually have M&A deals each year or some of them have several within a year. In such situation almost impossible to distinguish the effect of a particular transaction that's why such companies are not included in our sample. Also, not for all companies, there is sufficient data. Finally, there are also transactions of two subsidiaries that have the same parent company because such cases are about reorganization, and the parent company has control over both entities. Each M&A transaction was verified manually one by one to check if it meets our criteria.

Table 1 shows the sample distribution by acquirer nation. Almost half of all transactions in our sample both in terms of the number of transactions and value are made by Chinese companies. There is no surprise here as China largest economy of all in BRICS and so more companies from China engage in M&A deals. Share of other countries is between 6-20% in the number of deals and 7-23% in the value of the transaction.

Table 1 Sample description: distribution by acquirer nation

Country	Number of deals	Percentage % of all	Value of deals, millions dollars	Percentage % of all
China	42	42	96 693	52
Brazil	6	6	13 491	7
Russia	16	16	16 342	9
South Africa	20	20	15 853	9
India	16	16	42 390	23

Table 2 reports the annual numbers and values (in million dollars) of transactions by the year of the deal. I want two point out two periods of time: 2006-2009 and 2015-2016. As I showed previously the number of M&A transactions cyclical. It peaks in 2006-2009 before the financial crisis and just after it and 2015-2016. My sample shows the same, in terms of the number of deals year 2006-2010 have share 44% and in terms of the value of transaction 46%. Share of 2015-2016 in terms of number of deals 22% and terms of value 26%.

This evidence is consistent with the Grigorieva and Petrunina (2013) in their sample from 2002-2009 more than half – 48 deals out of 80 (60.0%) – was announced in 2007-2009.

Table 2 Sample description: distribution across completion years

Year	Number of deals	Percentage % of all	Value of deals, millions dollars	Percentage % of all
2006	3	3	22 764	12
2007	7	7	8 328	5
2008	7	7	27 402	15

2009	17	17	11 977	6
2010	10	10	14 161	8
2011	8	8	24 231	13
2012	5	5	1 777	1
2013	8	8	11 793	6
2014	6	6	5 794	3
2015	15	15	29 002	16
2016	7	7	18 003	10
2017	7	7	9 538	5

Figure 3 shows the M&A distribution by industry using The Refinitiv Business Classification (TRBC) code. Our sample consists of 34 industries. The largest proportion of deals almost 60% in terms of value are: Telecommunications Services, Metals & Mining and Machinery. Figure 4 shows the M&A distribution by industry in terms of number of deals the largest proportion of deals 42% are: Metals & Mining, Pharmaceuticals, Telecommunications Services, Real Estate Operations, Chemicals.

Figure 3 Sample description: distribution by industry in terms of value

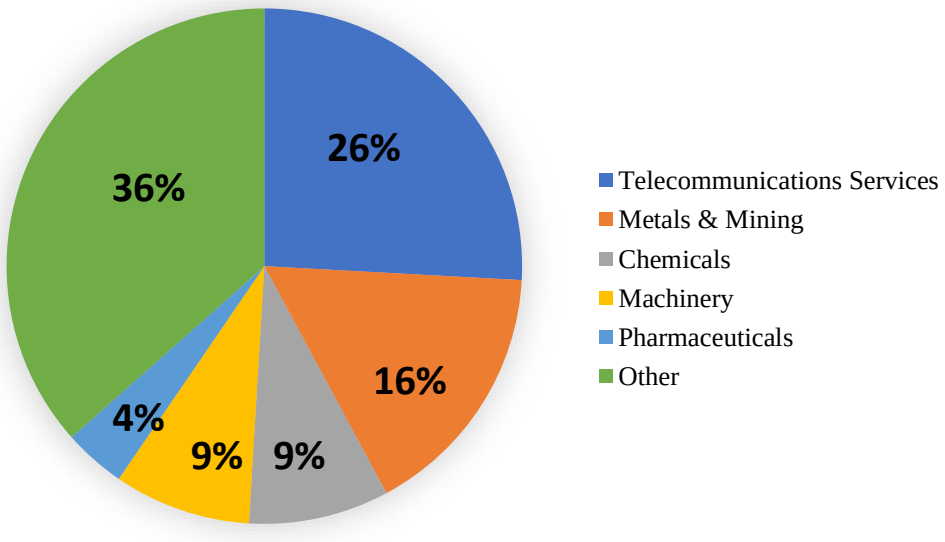


Figure 4 Sample description: distribution by industry in terms of number deals

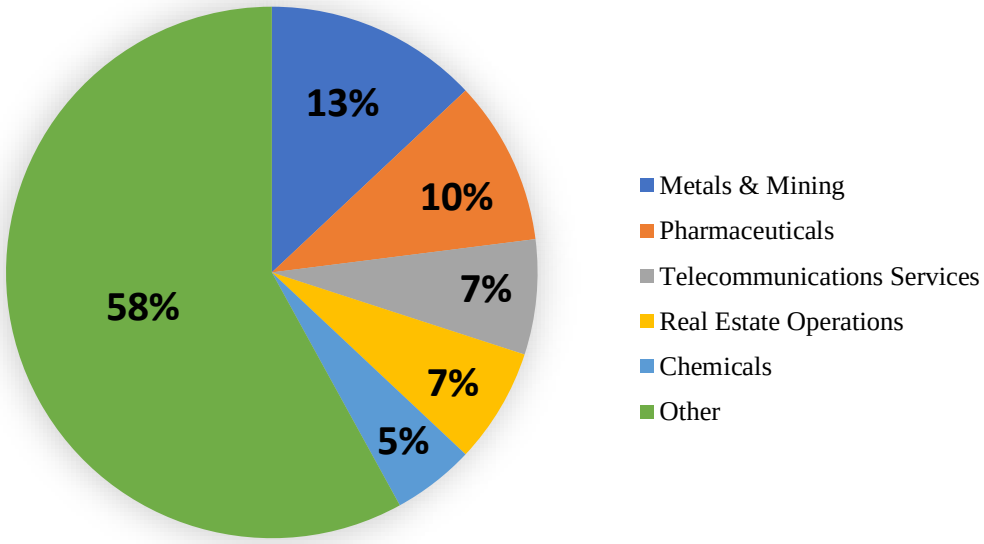


Table 3 presents main characteristics of deals: cash acquisitions account for 42% of the sample, whereas stock for 42% and mix 16% of deals. About one-third of the sample are cross-border acquisitions. Most of the M&A deals involve relatively large target companies. The median relative size of the target firm, defined as the ratio of target's market value to acquirer's market value prior to the takeover is 35%. Most of deals are the within the same industry group classified by The Refinitiv Business Classification (TRBC) first 4 digits of TRBC code for industry. Among all deals 12% is carried out by state-owned acquiror.

Table 3 Sample description: main characteristics of deals

Variable	Number of deals
Method of payment	
Cash	42
Stock	42
Mix	16
Cross-border deals	
Domestic	68
Cross-border	32
Relative size of target	
Target size < 20%	25
Target size 20-50%	45
Target size >50%	30
Idustry relatdness	

Focused	62
Diversified	38
State ownership	
State-owned	12
Private	88

2.3. Performance benchmark

Healy et al. (1992). introduced usage of industry median as a benchmark, to control for economywide and industry factors. Hence, they use the abnormal industry-adjusted performance of the target and bidding firms as our primary benchmark to evaluate post-merger performance. Barber and Lyon (1996) stated that matching sample firms to control firms on industry and performance is generally much more important than matching on industry alone, or industry and size. Other authors Ghosh (2001) and Powell and Stark (2005) argue that results based on adjustment for industry, size, and pre-performance-based matching are less biased and more reliable. Martynova et al. (2007) adjust for both industry (SIC-code) alone and industry, size, and pre-acquisition performance. When they adjust operating performance only by industry, they find that high pre-acquisition profitability is associated with higher post-acquisition profitability. However, when the adjustment is made based on industry, size, and performance, they observe a significant negative relation: high pre-acquisition profitability is followed by lower post-acquisition results. This highlights the importance of the adjustment approach employed and may explain the contradictory results across many studies.

It shows that this is very useful to employ both methods and compare results. As the main source of information for my thesis is Refinitiv Eikon I decided to use The Refinitiv Business Classification (TRBC) is the global, comprehensive, industry classification system owned and operated by Refinitiv. Complete coverage across 130 developed, emerging, and frontier countries. Covers over 72,000 public companies classified – more than any other sector classification system – with 2.4 million private companies and other related securities also available. TRBC companies are classified at five levels:

• 13 economic sectors
• 33 business sectors
• 62 industry groups
• 154 industries
• 898 activities

As a proxy for industry trends, we consider for each bidding and target firm from our sample the performance of a median company that operates in the same industry. The industry median is identified from the pool of all companies recorded in The Refinitiv database that have

same 4-digit industry code as our sample firm. The firm with the median EBITDA-to-assets ratio is then selected as our industry median peer.

As a proxy for industry, size and pre-performance for every acquisition, we require a benchmark for acquirer and other for target firms. Our benchmarks were constructed following Yen and André (2007) and Yen et al. (2013) and meet the presented criteria:

1. Same 4-digit primary The Refinitiv Business Classification code
2. Similar size measured as book value of total assets within 70% and 130% 1 year before takeover.
3. Similar pre-performance measured as EBIT-to-Assets ratio within 90% and 110% 1 year before takeover.
4. Same nation code as the bidder and the target.

If there is no match, the pre-performance restriction is extended by choosing a matching firm with EBIT-to-Assets between 50% and 150%. If still no firm meets the criteria, book value of assets is also extended within 25% and 200%.

2.4. Performance measures

Following Martynova et al. (2007), Grigorieva and Petrunina (2013) Papadakis and Thanos, Yen and André (2007), Rao-Nicholson et al. (2016) we employ two operating measures to compare pre and post-acquisition performance: EBITDA/BVassets, EBITDA/Sales. EBITDA/BVassets is the return on assets (ROA), measuring the firms' profitability, and EBITDA/BVassets is sales margin (ROS), providing a picture of the firms' effectiveness.

This mater thesis use EBITDA as a proxy for operating cash flow as most of the studies on post-merger / acquisition performance use operating performance measures such as 'pre-tax operating cash flow', which is the sum of operating income, depreciation, interest expenses, and taxes (see e.g. Healy et al., 1992; Ghosh, 2001; Heron and Lie, 2002; etc.).

The EBITDA is chosen because such performance measure is unaffected by applied accounting method in computing depreciation, interest, and taxes. That's why EBITDA could be used as a "pure" operating performance measure.

EBITDA is deflated to make financial ratios comparable between companies and over time (Rao-Nicholson et al., 2016). The book value of assets and sales are employed as deflators.

We use the book values of assets as a denominator rather than market values since the market value might already incorporate operating efficiencies at the date of the announcement (at least partially) (Grigorieva and Petrunina, 2013).

We calculate two measures of operating performance (Eq. 1,2) for each firm (i) in each year(t):

$$\text{ROA}_{i,t} = \frac{\text{EBITDA}_{i,t}}{BOOK\ VALUE\ OF\ ASSETS_{i,t}} \quad (1)$$

$$\text{ROS}_{i,t} = \frac{\text{EBITDA}_{i,t}}{SALES_{i,t}} \quad (2)$$

Firstly, following the methodology designed by Martynova et al. (2007), we start by computing "raw" measures without adjustment. ROA and ROS before merger/acquisition is the sum of acquirer's (A) and target's (T) EBITDA measures scaled by sum of acquirer's and target's BASE – the sum of the book value of assets in ROA and sales in ROS. When we sum EBITDA and BASE of two companies, we get measures of the combined firm before merger/acquisition (Eq.3).

$$\text{ROA(S)}_{combined\ firm,t} = \frac{\text{EBITDA}_{A,t} + \text{EBITDA}_{T,t}}{BASE_{T,t} + BASE_{A,t}} \quad (3)$$

Secondly, the peer pre-acquisition ROA and ROS of the combined firm is then computed as a weighted average of the acquirer's and the target's peer companies, where EBITDA of acquirer's and the target's peer companies is weighted relative to the size of the acquirer's and target's asset (sales) (Eq.4).

$$\text{ROA(S)}_{peer\ firm,t} = \frac{BASE_{A,t}}{BASE_{T,t} + BASE_{A,t}} \times \frac{\text{EBITDA}_{peerA,t}}{BASE_{peerA,t}} + \frac{BASE_{T,t}}{BASE_{T,t} + BASE_{A,t}} \times \frac{\text{EBITDA}_{peerTt}}{BASE_{peerT,t}} \quad (4)$$

Thirdly, the next step is to calculate measures without adjustment for the years following the acquisition. ROA and ROS after merger/acquisition is acquirer's EBITDA scaled by acquirer's BASE because now it's merged company (Eq.5)

$$\text{ROA(S)}_{firm,t} = \frac{\text{EBITDA}_{AT,t}}{BASE_{AT,t}} \quad (5)$$

Fourthly, we need to adjust post-acquisition measures as well. For industry adjustment peer post-acquisition ROA and ROS of the combined firm is calculated based only on the acquirer as now it's one firm, so now we need to adjust only for the acquirer industry to avoid double adjustment (Eq.6).

$$\text{ROA(S)}_{peer,t} = \frac{\text{EBITDA}_{peer\ A,t}}{BASE_{peer\ A,t}} \quad (6)$$

For industry, size and pre-performance the peer post-acquisition ROA and ROS of the combined firm is s calculated in a similar way as for the pre-acquisition years as a weighted average of the acquirer's and the target's peer companies. However, the weights used to compute the peer post-acquisition profitability are the ones that is used one-year prior takeover (Eq.7).

$$\mathrm{ROA(S)}_{peer\ firm,t} = \frac{BASE_{A,t-1}}{BASE_{T,t-1}+BASE_{A,t-1}} \times \frac{\mathrm{EBITDA}_{peerA,t}}{BASE_{peerA,t}} + \frac{BASE_{T,t-1}}{BASE_{T,t-1}+BASE_{A,t-1}} \times \frac{\mathrm{EBITDA}_{peerTt}}{BASE_{peerT,t}} \quad (7)$$

Finally, the company's performance adjusted for industry trend or industry, size, and pre-performance is calculated as s a difference between the company's and peer performance measures (Eq.8,9)

$$\mathrm{ROA(S)}_{ind-adj,t} = \mathrm{ROA(S)}_{firm,t} - \mathrm{ROA(S)}_{peer\ ind,t} \quad (8)$$

$$\mathrm{ROA(S)}_{ind,size,perf-adj,t} = \mathrm{ROA(S)}_{firm,t} - \mathrm{ROA(S)}_{peer\ ind,size,perf\ t} \quad (9)$$

Two main methods are used to estimate post-M&A performance: the change model and the intercept model, we employ both of them and then compare results.

In the study of Healy et al (1992) abnormal industry-adjusted performance is measured as the intercept of a cross-sectional regression of post-merger industry-adjusted or industry, size and performance adjusted cash flow returns on the corresponding premerger returns.

The intercept model estimates changes in operating performance before and after M&A transaction with the intercept (a) from the linear regression (Eq.10):

$$\text{median ROA(S)}_{adjusted}^{post\ M\&A} = \alpha + \beta \times \text{median ROA(S)}_{adjusted}^{pre\ M\&A} + \varepsilon \quad (10)$$

In regression Eq. (10) Median ROA(S)i adj post-M&A is computed as the median return on assets(sales) of each merged firm in the years [t=+1,...,+3] following the takeover date less the median return on assets(sales) of each control firm in the same years. Median ROA(S)i adj pre-M&A is the return on assets(sales) of each merged firm in the years [t=-3,..,-1] less the return on assets(sales) of each control company at the same time. The regression coefficients can be interpreted as follows: β is the coefficient and reflects the relation between pre- and post-acquisition performance, while the intercept α is an estimate of the mean amount of post-takeover performance left unexplained and must be, by definition, attributable to the takeover. Thus, if the value of α is significantly different from zero, there is evidence of a significant difference in the performance after the takeover, which is not explained by persistence in cash flows (Powell and Stark, 2005). For the test of significance for intercept model is used t-test.

Ghosh (2001) defended **a change model**, because the intercept model is more likely to produce biased estimates since the presence of outliers often characterizes accounting figures. Thus, computed Median change as the difference in industry or industry, size, and pre-performance adjusted return on assets/sales i between the post-and pre-acquisition periods where i denotes the ith acquisition. Instead of arbitrarily using any one of the three years to represent

either the pre- or the post-acquisition period, change model use the median of the industry or industry, size, and pre-performance adjusted return on assets/sales of years -1 to -3 to represent the pre-acquisition period (Median ROA(S)i adj pre-M&A). Similarly, the median of the years 1 to 3 represents the post-acquisition period for any acquisition i (Median ROA(S)i adjpost-M&A). Accordingly, Median change is the median of the differences between the median annual post-performance and median annual pre-performance for each of the 100 mergers and acquisitions.

$$\text{Median change} = \text{median ROA(S)}_{adjusted}^{post\ M\&A} - \text{median ROA(S)}_{adjusted}^{pre\ M\&A} + \varepsilon \quad (11)$$

Furthermore, due to the presence of outliers, we apply a Wilcoxon signed rank test, to test whether the median post-acquisition performance is significantly different from the median pre-acquisition performance (Martynova et al., 2007).

Change Model

Table 4 and 5 presents results of the change model as median return on assets and sales (pre, post and change) for the merged firms. Henceforth, we present only median figures because when dealing with accounting ratios estimates based on the medians are more informative (Ghosh, 2001).

Table 4 Changes in operating performance ROS, median (%)

	Raw performance	Industry-adjusted	Industry, Size and Perfomance adjusted
-3	18,51	4,85	0,44
-2	18,77	5,86	2,60
-1	19,83	6,48	1,79
Median pre-acquisition perfomance	18,68	5,39	1,62
1	20,13	6,42	2,19
2	19,19	6,52	2,36
3	19,35	5,97	1,93
Median post-acquisition perfomance	19,55	6,42	2,18
Median difference (Post-Pre)	1*	0,37 *	1,36 *

* Significant at the 1% level. Wilcoxon signed rank test shows that median post-acquisition performance is significantly different from median pre-acquisition performance.

Table 5 Changes in operating performance ROA, median (%)

	Raw performance	Industry-adjusted	Industry, Size and Perfomance adjusted
-3	10,44	1,30	0,01
-2	10,69	1,61	0,50
-1	10,27	2,36	0,20
Median pre-acquisition perfomance	10,43	1,63	0,18
1	11,06	2,51	0,33

2	11,27	2,79	1,84
3	9,93	2,15	1,09
Median post-acquisition perfomance	10,78	2,49	0,91
Median difference (Post-Pre)	0,11 *	0,97 *	0,98 *

* Significant at the 1% level. Wilcoxon signed rank test shows that median post-acquisition performance is significantly different from median pre-acquisition performance.

All of the six measures reveal significance at the 1% level at Wilcoxon signed-rank test. We can observe a significant positive increase 1% and 0,11% for ROS and ROA in "raw" measures and 0,37% and 0,97% for industry-adjusted measures and 1,36% and 0,98% for measures adjusted for industry, size and performance between pre-acquisition years and after.

As we can see industry-adjusted figures are less than raw performance but difference is positive meaning that sample companies outperform industry median.

For adjustment by industry, size and pre-performance selected companies outperform peer companies that are similar in size and performance.

All above leads to the conclusion that median post-acquisition performance is significantly positively different from median pre-acquisition performance. M&A deals create positive value for companies in BRICS and that difference in performance is due to the fact of M&A, not because of other factors.

Another important result presented in Tables 4 and 5 is that bidding and target companies significantly outperform the median companies in their respective industries before the takeover and after it. This suggests that companies undertake corporate acquisitions in periods when they are performing better than their median peers in the industry.

Intercept Model

The result of intercept model presented in Table 6 show similar results as change model. All coefficients are significant under 1% using t-test. Intercept show significant difference in the performance before and after the takeover, so it’s show is by how much on average post-merger median ROA or ROS is exceeding pre-merger.

For “raw” unadjusted measures ROS value is 12,62% and for ROA is 5,95%. For industry adjusted measures ROS is 6,86% and value for ROA is 2,56%. For adjustment by industry, size and pre-performance value for ROS is 4,15% and for ROS 2,19%. The results are in line with Powell and Stark (2005)

Table 6 Result of regression analysis of Intercept model

	Median ROS			Median ROA		
Adjustment	Raw performance	Industry	Industry, Size and Perfomance	Raw performance	Industry	Industry, Size and Perfomance
Intecrept estimate	0,1262*	0,0686*	0,0415*	0,0595*	0,0256*	0,0219*
Slope estimate	0,5081*	0,3757*	0,3736*	0,5426**	0,4726*	0,1753**
R-squared	0,557	0,374	0,354	0,285	0,218	0,208

* Significant at the 1%/ ** Significant at the 5% level using t-test

Conclusion

In table 7 presented resulted for both models. As we can observe for both Change and Intercept model results are similar – positive and statistically significant.

Out hypothesis H1 that there is significant negative change in the operating performance of the acquirer companies following M&A deals is not confirmed. The result is in line with previous studies (Linn and Switzer, 2001; Switzer, 1996; Healy et al., 1992; Powell and Stark, 2005; Kumar and Bansal, 2008)

Consistent with Powell and Stark (2005), Ghosh, (2001), Linn and Switzer (2001), and Switzer (1996), the intercept model gives structurally higher estimates of the performance improvements than the change model. The explanation is that the change model is based on medians and is therefore less sensitive to outliers, whereas the intercept model is based on means.

Table 7 Results of analysis for both models: Change and Intercept model

Adjustment	Industry		Industry, size, performance	
Measure	Change model	Intercept model	Change model	Intercept model
ROS, %	0,37 *	6,86*	1,36 *	4,15 *
ROA, %	0,97 *	2,56 *	0,98 *	2,19 *

* Significant at the 1% level. For intercept model is used t-test. For change model is used Wilcoxon signed rank test.

All models have been checked using several tests:

- The Breusch-Pagan test was used to test for heteroscedasticity because one of the key assumptions of linear regression is that the residuals are distributed with equal variance at each level of the predictor variable. Breusch-Pagan test showed that there is no heteroscedasticity.
- The Durbin Watson test used is to detect autocorrelation in the residuals from a regression analysis. The Durbin Watson test showed that there is no autocorrelation.

- The Shapiro-Wilk test was used to test normality of distribution of residuals. The Shapiro-Wilk test showed that distribution is normal
- A variance inflation factor (VIF) test was used to test multicollinearity among the independent variables in a multiple regression model. The value for all variables is less than 2,5, so there is no autocorrelation.

Robustness checks

Robustness checks involve reporting alternative specifications that test the same hypothesis. We want to know if our results are robust with respect to different specifications of the profitability measures. One step towards robustness was made in model selection as we use "raw" unadjusted measures and also two benchmark measures: industry adjustment and industry, size and pre-performance adjustment. Moreover, we use two different models: change model and intercept model in order to receive alternative results. As we know see all models suggest similar results that M&A create positive value. As next step for robustness check we recalculate changes in the operating performance using means rather than medians and for adjustment we use industry mean peers. For each combined firm, we calculate mean annual pre- and post-acquisition performance and adjust it to the mean pre- and post-operating performance of the combined peer companies.

The result of robustness check using means is presented in table 8 both for change and intercept model we can see that result are positive and significant.

Table 8 Results of analysis for both models using means

Adjustment	Industry adjusted		Industry, size, performance	
Measure	Change model	Intercept model	Change model	Intercept model
ROS, %	1,34*	6,24**	2,08*	3,74 **
ROA, %	1,21*	1,87 *	1,42*	1,58 **

* Significant at the 1% level. ** Significant at the 5% level. For intercept model is used t-test. For change model is used Wilcoxon signed rank.

Final step of robustness check is to also check if financial crisis of 2007-2009 has effect on companies in our data sample as almost half of deals took place in 2006-2010. To do so I use subsample that consist of M&A deals in 2013-2017. From 2013 because I use 3 years of operating performance before and after the deal, so in that case first year of data is in 2010, the overall number of deals is 43. The results of analysis in Table 9 show us that as values are positive and significant as well. The result mean that conclusions made for the whole sample is not affected by the fact of financial crisis.

Table 9 Results of analysis for both models for subsample 2013-2017

Adjustment	Industry		Industry, size, pre-performance	
Measure	Change model	Intercept model	Change model	Intercept model
ROS, %	1,26*	7,99*	1,85*	5,39*
ROA, %	1,06*	2,5*	1,55*	2,54*

* Significant at the 1% level. For intercept model is used t-test. For change model is used Wilcoxon signed rank test.

2.5. The determinants of post-M&A operating performance

In this section, we investigate whether different determinants of the M&A deal predict the post-acquisition performance of the combined firm. For correlation matrix of variables see Appendix 3-6.

Set of variables:

1. Method of payment: cash versus stock versus mix. We have three dummy variables for cash, stock and mix.
2. Domestic versus cross-border deals. 0 if target and acquirer from the same country, 1 if from different.
3. Industry relatedness. Measured by using the TRBC classification of industries (1– for unrelated; 0 – for related). For this research, a four-digit code is used.
4. State ownership. More than 50% of shares are owned by Government (0 – not state-owned; 1 – for state-owned).
5. The relative size of the target to acquirer firm: market size of target firm/market size of acquirer firm.

The model using set of variables is presented in (Eq11).

$$\text{median ROA(S)}_{adjusted}^{post\ M\&A} = \alpha + \beta_i \times \text{median ROA(S)}_{adjusted}^{pre\ M\&A} + \delta_i CASH + \tau_i STOCK + \theta_i MIX + \lambda_i CROSSBORDER + \mu_i RELATEDNESS + \phi_i STATE + \eta_i REALATIVESTARGET + \varepsilon_i \quad (11)$$

Table 10 Result of regression analysis of variables

	Median ROS		Median ROA	
Adjustment	Industry	Industry, Size and Perfomance	Industry	Industry, Size and Perfomance
Intercept estimate	0,0361*	0,0382**	0,0144**	0,0121**
Slope estimate	0,3475**	0,3448*	0,4226*	0,1824*
Cash	0,0109	0,0151	0,0057	0,0102
Stock	-0,0394	-0,0308	-0,0216	0,0083

Mix	-0,0075	-0,0171	-0,0043	-0,0156
Cross-border	0,0373	0,0366	0,0275**	0,0237**
Unrelated	-0,0266	-0,0085	-0,0039	-0,0107
State ownership	-0,0236	-0,0171	-0,0213**	-0,0102**
Relative size of target	0,0342*	0,0418**	0,0196	0,0234
R-squared	0,423	0,416	0,289	0,285

* Significant at the 1% level / ** Significant at the 5% level using t-test.

Method of payment: cash versus stock

As presented in Table 10 value for variable Cash is positive and value of Mix and Stock is negative both for ROA and ROS but none of them are significant.

Our hypothesis H2 that cash-financed M&A is likely to have a positive effect on post-M&A performance is rejected. The results are in line with previous studies (Healy et al., 1992; Powell and Stark, 2005; Martynova et al., 2007; Heron and Lie, 2002; Sharma and Ho, 2002; Rao-Nicholson et al., 2016)

Industry relatedness

As presented in Table 10 value for variable Unrelated is negative as compared to related deals but not significant both for ROA and ROS.

Out hypothesis H3 that relatedness of industries is likely to have no effect on post-M&A operating performance is confirmed. The results are in line with previous studies (Powell and Stark, 2005; Linn and Switzer, 2001; Switzer, 1996; Sharma and Ho, 2002, Martynova et al., 2007; Rao-Nicholson et al., 2016)

Domestic versus cross-border

As presented in Table 10 value for variable Cross-border for ROS is positive but not significant. Value for ROA is 2,75% for industry-adjusted and 2,37% for industry, size and performance adjusted both significant under 5%. Meaning that Cross-border deals outperform domestic ones on average by 2,37 - 2,75%. As we mentioned countries from emerging economies is seeking knowledge, recourses, technology and ways to enter developed markets. If we take a closer look on cross-border deals from our sample we will see that in 28 out of 32 cross-border deals target company is from United States, United Kingdom, Australia, Canada and other developed countries, so BRICS companies making M&A with companies from more developed markets that give them additional improvement in operating performance as compared to domestic M&As.

Our hypothesis H4 that cross-border deals are likely to have a negative effect on post-M&A performance as compared to domestic deals is rejected.

The relative size of the target

As presented in Table 10 value for variable Relative size of target for ROS is 3,42% for industry-adjusted and significant under 1% and value for industry, size and performance adjusted is 4,18% and significant under 5%. Value for ROA is positive but not significant. Meaning that the larger the target in M&A leads to 3,42 – 4,18% higher increase in ROS. The results are in line with Martynova et al. (2007). As we stated takeovers of relatively large targets are more likely to achieve sizeable operating and financial synergies and economies of scale than small acquisitions, therefore leading to stronger post-acquisition operating performance (Martynova et al., 2007).

Our hypothesis H5 that the relative size of the target is likely to have no effect on post-M&A operating performance is rejected.

State ownership

As presented in Table 10 value for variable State ownership for ROS is negative but not significant. Value for ROA is -2,13% for industry-adjusted and -1,02 for industry, size and performance adjusted both significant under 5%.Meaning that State ownership leads to 1,02 - 2,13% lower ROA as compared to privately-owned companies. As we stated, negative impact of State ownership can be due to incentives problems or the fact that state-owned firms per se follow other objectives than profit maximization (Bertrand and Betschinger, 2012).

Our hypothesis H6 that State ownership is likely to have negative effect on post-M&A operating performance is confirmed. The results are in line with Bertrand and Betschinger (2012)

All models again have been checked using several tests:

- The Breusch-Pagan test was used to test for heteroscedasticity. Breusch-Pagan test showed that there is no heteroscedasticity.
- The Durbin Watson test used is to detect autocorrelation in the residuals. The Durbin Watson test showed that there is no autocorrelation.
- The Shapiro-Wilk test was used to test normality of distribution of residuals. The Shapiro-Wilk test showed that distribution is normal.

Robustness checks

In order to conduct robustness check we will follow steps as in paragraph 2.4. First, we obtain result using means instead of medians and for the second step we also obtain result for subsample 2013-2017 in order to check for financial crisis effect.

As we can see in Table 11 result using means are in line with median result. The same is for calculation of operating performance for 2013-2017 subsample (Table 12), results are in line with result for the whole sample 2006-2017. All coefficients have the same sign and significant under 5% using t-test.

Table 11 Result of regression analysis of variables using Means

	Median ROS		Median ROA	
Adjustment	Industry	Industry, Size and Perfomance	Industry	Industry, Size and Perfomance
Intercept estimate	0,0392*	0,0119*	0,0106*	0,0102*
Slope estimate	0,3183	0,3399	0,488	0,2841
Cross-border	0,0473	0,0202	0,0233**	0,0237**
State ownership	-0,0445	-0,0121	-0,0243**	-0,0293**
Relative size of target	0,0212**	0,0311**	0,0154	0,0098
R-squared	0,394	0,426	0,287	0,296

* Significant at the 1% level / ** Significant at the 5% level using t-test.

Table 12 Result of regression analysis of variables for subsample 2013-2017

	Median ROS		Median ROA	
Adjustment	Industry	Industry, Size and Perfomance	Industry	Industry, Size and Perfomance
Intercept estimate	0,0846*	0,0428*	0,022*	0,0228**
Slope estimate	0,2478	0,2263	0,4509	0,01925
Cross-border	0,041	0,0351	0,0195**	0,0171*
State ownership	-0,1044	-0,0393	-0,0257**	-0,0162**
Relative size of target	0,0188**	0,0192**	0,0181	0,0245
R-squared	0,249	0,206	0,305	0,223

* Significant at the 1% level / ** Significant at the 5% level using t-test.

Summary of Chapter 2

The goal of this master thesis is to answer the question whether corporate mergers and acquisitions have impact on company performance in BRICS countries based on the sample of 100 deals that took place in 2006-2017. In order to answer this question, we use accounting-based studies. The EBITDA is chosen as indicator of operating performance because such performance measure is unaffected by applied accounting method in computing depreciation, interest, and taxes. EBITDA could be used as a "pure" operating performance measure. EBITDA is deflated to make financial ratios comparable between companies and over time. The book value of assets and sales are employed as deflators. Return on assets (ROA), measuring the firms' profitability, and

Sales margin (ROS), providing a picture of the firms' effectiveness. Also, we adjust performance measure to industry trends as the improvement in operating performance could be due to overall industry factor and not due to the fact of M&A deal. Moreover, we also adjust for industry, size and preperformance as some authors suggest that companies that enter in M&A deals outperform industry peers.

We use two models for the assessment, Intercept model in which abnormal industry-adjusted performance is measured as the intercept of a cross-sectional regression of post-merger industry-adjusted or industry, size and performance adjusted cash flow returns on the corresponding premerger returns, for test of significance is used t-test. Also, we used change model which calculate median change in operating adjusted performance between the post-and pre-acquisition periods, for test of significance is used Wilcoxon signed rank test.

As we determined M&A create positive value for companies. Using change model from 0,37-0,99% for ROS and 0,63-0,66% for ROA. Using intercept model from 4,15-6,86% for ROS and 2,10-2,56% for ROA depending on adjustment measure. As we can see intercept model gives higher results as compared to change model. The explanation is that the change model is based on medians and is therefore less sensitive to outliers, whereas the intercept model is based on means.

The next step was to estimate what factors could influence post-M&A operating performance of the company. Based on the literate review we picked following factors:

- Method of payment
- Domestic versus cross-border deals
- Industry relatedness
- State ownership
- The relative size of the target

All factors have been included in the model and tested on significance, so that the result are following:

- Value for variable relative market value of target to market value of acquirer for ROS is 3,42% for industry-adjusted and significant under 1% and value for industry, size and performance adjusted is 4,18% and significant under 5%. Value for ROA is positive but not significant. Meaning that the larger the target in M&A leads to 3,42 – 4,18% higher increase in ROS.
- Value for variables Cross-border for ROS is positive but not significant. Value for ROA is 2,75% for industry-adjusted and 2,37% for industry, size and performance

adjusted both significant under 5%. Meaning that Cross-border deals outperform domestic ones on average by 2,37 - 2,75%.

- Value for variable State ownership for ROS is negative but not significant. Value for ROA is -2,13% for industry-adjusted and -1,02% for industry, size and performance adjusted both significant under 5%. Meaning that State ownership leads to 1,02 - 2,13% lower ROA as compared to privately-owned companies.

CONCLUSION

This master thesis contributes to existing literature on mergers and acquisitions by investigating post-M&A performance of 100 BRICS deals over 2006–2017 years. Using two operating measures Return on Assets and Return on Sales adjusted for industry and industry, size, performance we find an enhancement of post-M&A performance of the combined firms. Both change and intercept model suggest similar significant results. We also as Martynova et al (2007) find that both acquiring and target companies significantly outperform the median peers in their industry prior to the takeovers. We also reveal the same conclusion that the estimation of changes in post-merger profitability critically depend on the model applied to estimate the changes. Generally, an increase in profitability following M&As is higher when the intercept model is applied, whereas the change model returns lower estimates of the increase in post-acquisition profitability.

Our analysis of the determinants of the post-acquisition operating performance reveals that relative size of target to acquirer for ROS is positive and significant. A possible explanation is that larger M&As have a greater scope to explore financial and operating synergies, which is likely to result in a sizable improvement in profitability of the combined firm (Martynova et al, 2007). Value for cross-border deals for ROA is positive and significant. The explanation for this in 28 out of 32 cross-border deals target company is from United States, United Kingdom, Australia, Canada and other developed countries, so BRICS companies making M&A with companies from more developed markets that give them additional improvement in operating performance as compared to domestic ones. Value for State ownership for ROA is negative and significant. State acquisitions could lead to a worse performance of acquirers due to a possible intermingling of political and profit objectives as well as the in general lower internal efficiency incentives and stronger organizational rigidities that are associated with State ownership maximization (Bertrand and Betschinger, 2012). None of the other takeover characteristics such as means of payment, and industry-relatedness have significant explanatory power.

Managerial application of this study is determined by the results of empirical research. Our result is valuable for managers and various investors. According to our results M&A leads to increase in operating performance. Also, size and geographical location of target affect the result as cross-border deals and larger targets lead to greater post-M&A improvements. However, investors should be careful with M&A deals with state-owned acquirer as State ownership leads to lower results of post-M&A improvements as compared to privately-owned companies.

This dissertation, however, has some limitations. Sample consist of 100 transactions and for future analysis it could be extended. Moreover, usage of adjustment for industry, size and pre-

performance is a lot more difficult in BRICS countries than, for example in EU or US. As there are less companies with available financial statements similar to those in our sample. In some cases, we needed to make the criteria less stringent, which of course leads to a decrease in the accuracy of the results but all peer-companies are meet the requirements of our methodology. Also, part of companies uses only domestic financial statements standards, for example, Chinese or Brazilin and do not use generally accepted IFRS or US GAAP. Of course, domestic standards are regulated as well and we can see process of general elimination of differences in standards but it could lead to decrease in the accuracy of the results.

In this study, we focused on studying the operational effectiveness of M&A transactions over the long term, studying the financial statements of the companies involved in the transaction. An improvement in the operating efficiency of companies does not not necessarily leads to increase in value of the company. Therefore, the next step in researching the effectiveness of mergers and acquisitions can be to study their impact on the company's value based on the analysis of economic profit for several years before and after the M&A transaction.

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APPENDIX

Appendix 1 Key studies on post-acquisition operating performance

Study	Study period, sample size, country	Operating efficiency indicator	Operating indicator adjustments by	Main conclusions
Healy, Palepu, Ruback, 1992	1979-1984; 50 largest US mergers	Pre-tax operating cash flow to TM	Industry	Significant improvements in operating efficiency; positive relationship between excess returns and operating performance indicators
Switzer, 1996	1967-1987; 324 acquisitions; USA	Operating cash flow pre-tax operating cash flow to TMV	Industry	Significant improvements in the operating efficiency of the companies involved in the transaction
Tsung-Ming, Hoshino, 2000	1987-1992; 20 acquisitions; Taiwan	ROA, ROE, financial leverage, liquidity ratios, sales growth)	Industry	Positive reaction of the stock market to M&A; decrease in operating performance of buying companies as a result of transactions; no correlation between accumulated excess returns and companies operating performance
Ghosh, 2001	1981-1995; 315 mergers; USA	Operating cash flow pre-tax operating cash flow to TMV	Industry and Industry, size and pre-performance	No significant improvements found in the operating efficiency of companies
Yeh, Hoshino, 2001	1970-1994; 86 acquisitions; Japan	ROE, ROA	Industry	M&A involving keiretsu lead to a significant decrease in ROE, ROA; M&A with the participation of independent firms - no
Powell, Stark, 2005	1985-1993; 191 acquisitions; Great Britain	operating cash flow to TMV or TMV adjusted for market reaction to the takeover or BV assets or Sales)	Industry and Industry, size and pre-performance	Significant improvements in the operating efficiency of companies

Martynova, Oosting, Renneboog, 2006	1997-2001; 155 acquisitions; Europe	EBITDA – WC to BVassets , EBITDA – WC to Sales, EBITDA to BVassets, EBITDA to Sales	Industry and Industry, size and pre-performance	Participating companies transactions are more efficient than their peers before the transaction, and after it decrease in operating efficiency of purchasing companies, which becomes insignificant after control over the performance of peer companies
Papadakis and Thanos, 2010	1997–2003; 50 acquisitions Greece	ROA to book value of assets	Industry	Overall, results from the three measures indicate failure rates from 50% to 60%.
Bertrand and Betschinger, 2012	1998-2008; 609 acquisitions; Russia	Pre-tax Cash flow to book value of assets	None	Based on a sample of more than 600 acquirers we show that both domestic and international acquisitions tend to reduce the performance of acquirers compared to non-acquiring firms
Grigorieva and Petrunina 2013	2002-2009; 80 acquisitions; Emerging markets	EBITDA – WC to BVassets , EBITDA – WC to Sales, EBITDA to BVassets, EBITDA to Sales	Industry and Industry, size and pre-performance	M&As are value-destroying deals for the combined firms. Results from the long-run analysis prove the negative industry-adjusted differences between post-acquisition and pre-acquisition performance measures. The difference is equal to a significant -3.3% for the EBITDA/Sales ratio.
Rao-Nicholson et al., 2016	2001-2012; 57 acquisitions; ASEAN countries	EBITDA to book value of assets; EBITDA to SALES	Industry and Industry, size and pre-performance	The industry-adjusted operating performance tends to decline in the 3 years following an M&A. Yet, the results suggest that M&As completed during the financial crisis are more

Appendix 2 Sample of deals

Target Full Name	Acquiror Full Name	Date	Deal Value, millions USD
China Netcom Group Corp (Hong Kong)Ltd	China Unicom Ltd	2008	25 415
Inco Ltd	Cia Vale do Rio Doce SA	2006	17 153
China CNR Corp Ltd	CSR Corp Ltd	2015	12 801
Qinghai Salt Lake Industry Group Co Ltd	Qinghai Salt Lake Potash Co Ltd	2011	8 797
OAO "Sil'vinit"	Uralkalii PAO	2011	6 778
Ingram Micro Inc	Tianjin Tianhai Investment Co Ltd	2016	6 067
Tele Norte Leste Participacoes SA	Brasil Telecom SA	2011	5 850
Vivo Participacoes SA	Telecommunicacoes de Sao Paulo SA	2010	5 528
Investcom LLC	MTN Group Ltd	2006	5 500
Shanghai Oriental Pearl(Group) Co Ltd	Bestv New Media Co Ltd	2015	5 464
Smithfield Foods Inc	Shuanghui International Holdings Ltd	2013	4 752
Golden Telecom Inc	OAO "Vympel-Kommunikatsii" {Vimpelkom}	2007	4 231
Wuhan Iron&Steel Co Ltd	Baoshan Iron & Steel Co Ltd	2016	4 157
Sterlite Industries(India)Ltd	Sesa Goa Ltd	2013	3 911
Ranbaxy Laboratories Ltd	Sun Pharmaceutical Industries Ltd	2015	3 226
Anhanguera Educacional Participacoes SA	Kroton Educacional SA	2014	3 140
GreatWall Information Industry Co Ltd	China Greatwall Computer Shenzhen Co Ltd	2016	2 854
Dongfang Boiler(Group)Co Ltd	Dongfang Electrical Machinery Co Ltd	2007	2 832
Felix Resources Ltd	Yanzhou Coal Mining Co Ltd	2009	2 809
CETIP SA-Mercados Organizados	BM&F Bovespa SA Bolsa de Valores Mercadorias e Futuros	2017	2 701
Avolon Holdings Ltd	Bohai Leasing Co Ltd	2015	2 532
Mattress Firm Holding Corp	Steinhoff International Holdings NV	2016	2 421

Shanghai Bailian Group Co Ltd	Shanghai Friendship Group Inc Co	2010	2 402
Aditya Birla Nuvo Ltd	Grasim Industries Ltd	2017	2 369
Capital Property Fund Ltd	Fortress Income Fund Ltd	2015	2 235
David Jones Ltd	Woolworths Holdings Ltd	2014	2 017
China National Materials Co Ltd	China National Building Material Co Ltd	2017	1 950
Tumi Holdings Inc	Samsonite International SA	2016	1 809
OAO "Torgovyi Dom Kopeyka"	X5 Retail Group NV	2010	1 650
Reliance Natural Resources Ltd	Reliance Power Ltd	2011	1 530
AGRE Empreendimentos Imobiliarios SA	PDG Realty SA Empreendimentos & Participacoes	2010	1 373
Sadia SA	Perdigao SA	2009	1 307
Pangbourne Properties Ltd	Capital Property Fund Ltd	2010	1 271
Lai Wu Steel Corp	Jinan Iron & Steel Co Ltd	2010	1 201
Videocon d2h Ltd	Dish TV India Ltd	2017	1 186
Raia SA	Drogasil SA	2011	1 177
Centrais Eletricas do Para SA {CELPA}	Equatorial Energia SA	2012	1 139
Shanghai Airlines Co Ltd	China Eastern Airlines Corp Ltd	2009	1 097
Shanghai Industrial Pharmaceutical Investment Co Ltd	Shanghai Pharmaceutical Co Ltd	2009	1 057
Satyam Computer Services Ltd	Tech Mahindra Ltd	2013	1 018
ApexHi Properties Ltd	Redefine Income Fund Ltd	2009	1 017
Duratex SA	Satipel Industrial SA(NOW 5E9657)	2009	965
Pangang Group Sichuan Changcheng Special Steel Co Ltd	Panzhihua New Steel & Vanadium Co Ltd	2009	960
Guangzhou Baiyunshan Pharmaceutical Co Ltd	Guangzhou Pharmaceutical Co Ltd	2013	929
Chengde Xinxin Vanadium & Titanium Stock Co Ltd	Tangshan Iron & Steel Co Ltd	2009	826
Acucap Properties Ltd	Growthpoint Properties Ltd	2015	727
Multi-Fineline Electronix Inc	Suzhou Dongshan Precision Manufacturing Co Ltd	2016	622
YiChang HEC ChangJiang Pharmaceutical Co Ltd	Guangdong HEC Technology Holding Co Ltd	2017	578
Advanta Ltd	UPL Ltd	2015	565
Aracruz Celulose SA	Votorantim Celulose e Papel SA	2009	528
Cipla Medpro South Africa Ltd	Cipla Ltd	2013	503
Torch Automobile Group Co Ltd	Weichai Power Co Ltd	2007	467

Empresa Energetica de Mato Grosso do Sul{Enersul SA} (Magistra)	Rede Energia SA	2008	446
Datasul SA	Totvs SA	2008	444
Henan Topfond Pharmaceutical Co Ltd	China Meheco Co Ltd	2013	442
Hebei Taihang Cement Co Ltd	BBMG Corp	2010	408
The Pivotal Fund Ltd	Redefine Properties Ltd	2017	380
Shenzhen Chiwan Petroleum Supply Base Co Ltd	Shenzhen New Nanshan Holding (Group) Co Ltd	2017	374
Company SA	Brascan Residential Properties SA	2008	370
WCI Steel Inc	Severstal PAO	2007	370
Wyeth Ltd	Pfizer Ltd	2014	366
Xueda Education Group	Xiamen Insight Investment Co Ltd	2015	353
AO KoZhaN	Geo-Jade Petroleum Corp	2015	350
Chia Hsin Cement Greater China Holding Corp	TCC International Holdings Ltd	2007	322
Zhejiang Xinhu Venture Investment Co Ltd	Xinhu Zhongbao Co Ltd	2009	315
Southern Iron & Steel Co Ltd	JSW Steel Ltd	2008	314
KazakhGold Group Ltd	Polius Zoloto OAO	2009	294
DRAXIS Health Inc	Jubilant Organosys Ltd	2008	255
Haier Electronics Group Co Ltd	Qingdao Haier Co Ltd	2010	250
Business Connexion Group Ltd	Telkom SA SOC Ltd	2015	249
Shell Electric Mfg(Holdings)Co Ltd	China Overseas Land & Investment Ltd	2009	247
Premium Properties Ltd	Octodec Investments Ltd	2014	242
Novus Energy Inc	Yanchang Petroleum International Ltd	2013	221
DUSA Pharmaceuticals Inc	Sun Pharmaceutical Industries Ltd	2012	212
Mirabell International Holdings Ltd	Belle International Holdings Ltd	2009	199
Norton Gold Fields Ltd	Zijin Mining Group Co Ltd	2012	197
Shasun Pharmaceuticals Ltd	Strides Arcolab Ltd	2015	182
OAO "Kazan'kompressormash"	HMS Hydraulic Machines & Systems Group PLC	2012	168
Abyara Planejamento Imobiliario SA	Brasil Brokers Participacoes SA	2008	159
Planar Systems Inc	Leyard Optoelectronic Co Ltd	2015	150
Yantai Raffles Shipyard Ltd	China International Marine Containers (Group) Co Ltd	2009	142
Promethean World PLC	NetDragon Websoft Inc	2015	130
Politeno Industria e Comercio SA	Braskem SA	2006	111

Birmingham City PLC	Grandtop International Holdings Ltd	2009	94
Ridge Mining PLC	Aquarius Platinum Ltd	2009	91
LeapFrog Enterprises Inc	Vtech Holdings Ltd	2016	73
Natrol Inc	Plethico Pharmaceuticals Ltd	2007	63
Amalgamated Appliance Holdings Ltd{AMAP}	The Bidvest Group Ltd	2012	61
Barnard Jacobs Mellet Holdings Ltd	FirstRand Ltd	2011	60
Cardiac Science Corp	Opto Circuits (India) Ltd	2010	55
Keaton Energy Holdings Ltd	Wescoal Holdings Ltd	2007	42
Perilya Ltd	Shenzhen Zhongjin Lingnan Nonfemet Co Ltd	2009	30
Solvay Pharma India Ltd	Abbott India Ltd	2011	26
Ciba India Ltd	BASF India Ltd	2010	23
Halonix Ltd	Suprajit Engineering Ltd	2015	20
Japaninvest Group PLC	Haitong International Securities Group Ltd	2015	20
LiveWire Mobile Inc	OnMobile Global Ltd	2013	18
Xceed Resources Ltd	Keaton Energy Holdings Ltd	2014	18
Grabal Alok Impex Ltd	Alok Industries Ltd	2011	13
Control Instruments Group Ltd	Torre Industrial Holdings Ltd	2014	12

Appendix 3 Correlation matrix for industry, size and performance adjusted ROS

Variable	Median post-acquisition ROS	Median pre-acquisition ROS	cross-border	unrelated	state	cash	mix	stock	Target value/Acquiror value
Median post-acquisition ROS	1,00	0,61	0,1	0,11	-0,09	0,12	-0,11	-0,20	0,28
Median pre-acquisition ROS	0,61	1,00	0,09	0,21	-0,11	0,16	-0,06	-0,20	0,21
cross-border	0,1	0,09	1,00	0,08	-0,19	0,28	-0,24	-0,20	-0,02
unrelated	0,11	0,21	0,08	1,00	-0,16	0,21	-0,12	-0,12	0,12
state	-0,09	-0,11	-0,19	-0,16	1,00	-0,13	0,17	0,00	-0,05
cash	0,12	0,16	0,28	0,21	-0,13	1,00	-0,37	-0,72	-0,06
mix	-0,11	-0,06	-0,24	-0,12	0,17	-0,37	1,00	-0,37	0,06
stock	-0,20	-0,20	-0,20	-0,12	0,00	-0,72	-0,37	1,00	0,01
Target value/Acquiror value	0,28	0,21	-0,02	0,12	-0,05	-0,06	0,06	0,01	1,00

Appendix 4 Correlation matrix for industry, size and performance adjusted ROA

Variable	Median post-acquisition ROA	Median pre-acquisition ROA	cross-border	unrelated	state	cash	mix	stock	Target value/Acquiror value
Median post-acquisition ROA	1	0,14	0,21	0,15	-0,11	0,19	-0,16	-0,07	0,14
Median pre-acquisition ROA	0,14	1,00	0,12	0,21	-0,02	0,15	0,01	-0,16	0,19
cross-border	0,21	0,12	1,00	0,08	-0,19	-,28	-0,24	-0,20	-0,02
unrelated	0,15	0,21	0,08	1,00	-0,16	0,21	-0,12	-0,12	0,12
state	-0,11	-0,02	-0,19	-0,16	1,00	-0,13	0,17	0,00	-0,05
cash	0,19	0,15	0,28	0,21	-0,13	1,00	-0,37	-0,72	-0,06
mix	-0,16	0,01	-0,24	-0,12	0,17	-0,37	1,00	-0,37	0,06
stock	-0,07	-0,16	-0,20	-0,12	0,00	-0,72	-0,37	1,00	0,01
Target value/Acquiror value	0,14	0,19	-0,02	0,12	-0,05	-0,06	0,06	0,01	1,00

Appendix 5 Correlation matrix for industry-adjusted ROS

Variable	Median post-acquisition ROS	Median pre-acquisition ROS	cross-border	unrelated	state	cash	mix	stock	Target value/Acquiror value
Median post-acquisition ROS	1	0,61	0,05	0,02	-0,17	0,12	-0,09	-0,19	0,24
Median pre-acquisition ROS	0,61	1,00	-0,05	0,14	-0,12	0,16	-0,07	-0,21	0,20
cross-border	0,05	0,05	1,00	0,08	-0,19	0,28	-0,24	-0,20	-0,02
unrelated	0,02	0,14	0,08	1,00	-0,16	0,21	-0,12	-0,12	0,12
state	-0,17	-0,12	-0,19	-0,16	1,00	-0,13	0,17	0,00	-0,05
cash	0,12	0,16	0,28	0,21	-0,13	1,00	-0,37	-0,72	-0,06
mix	-0,09	-0,07	-0,24	-0,12	0,17	-0,37	1,00	-0,37	0,06
stock	-0,19	-0,21	-0,20	-0,12	0,00	-0,72	-0,37	1,00	0,01
Target value/Acquiror value	0,24	0,20	-0,02	0,12	-0,05	-0,06	0,06	0,01	1,00

Appendix 6 Correlation matrix for industry-adjusted ROA

Variable	Median post-acquisition ROA	Median pre-acquisition ROA	cross-border	unrelated	state	cash	mix	stock	Target value/Acquiror value
Median post-acquisition ROA	1	0,47	0,27	0,08	-0,20	0,20	-0,13	-0,10	0,09

Median pre-acquisition ROA	0,47	1,00	0,19	0,05	-0,14	0,16	-0,03	-0,14	0,14
cross-border	0,27	0,19	1,00	0,08	-0,19	0,28	-0,24	-0,20	-0,02
unrelated	0,08	0,05	0,08	1,00	-0,16	0,21	-0,12	-0,12	0,12
state	-0,20	-0,14	-0,19	-0,16	1,00	-0,13	0,17	0,00	-0,05
cash	0,20	0,16	0,28	0,21	-0,13	1,00	-0,37	-0,72	-0,06
mix	-0,13	-0,03	-0,24	-0,12	0,17	-0,37	1,00	-0,37	0,06
stock	-0,10	-0,14	-0,20	-0,12	0,00	-0,72	-0,37	1,00	0,01
Target value/Acquiror value	0,09	0,14	-0,02	0,12	-0,05	-0,06	0,06	0,01	1,00